

WHFS

Point Data Display Operations Guide

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AWIPS Build OB2
National Weather Service
Office of Hydrologic Development
Hydrology Laboratory

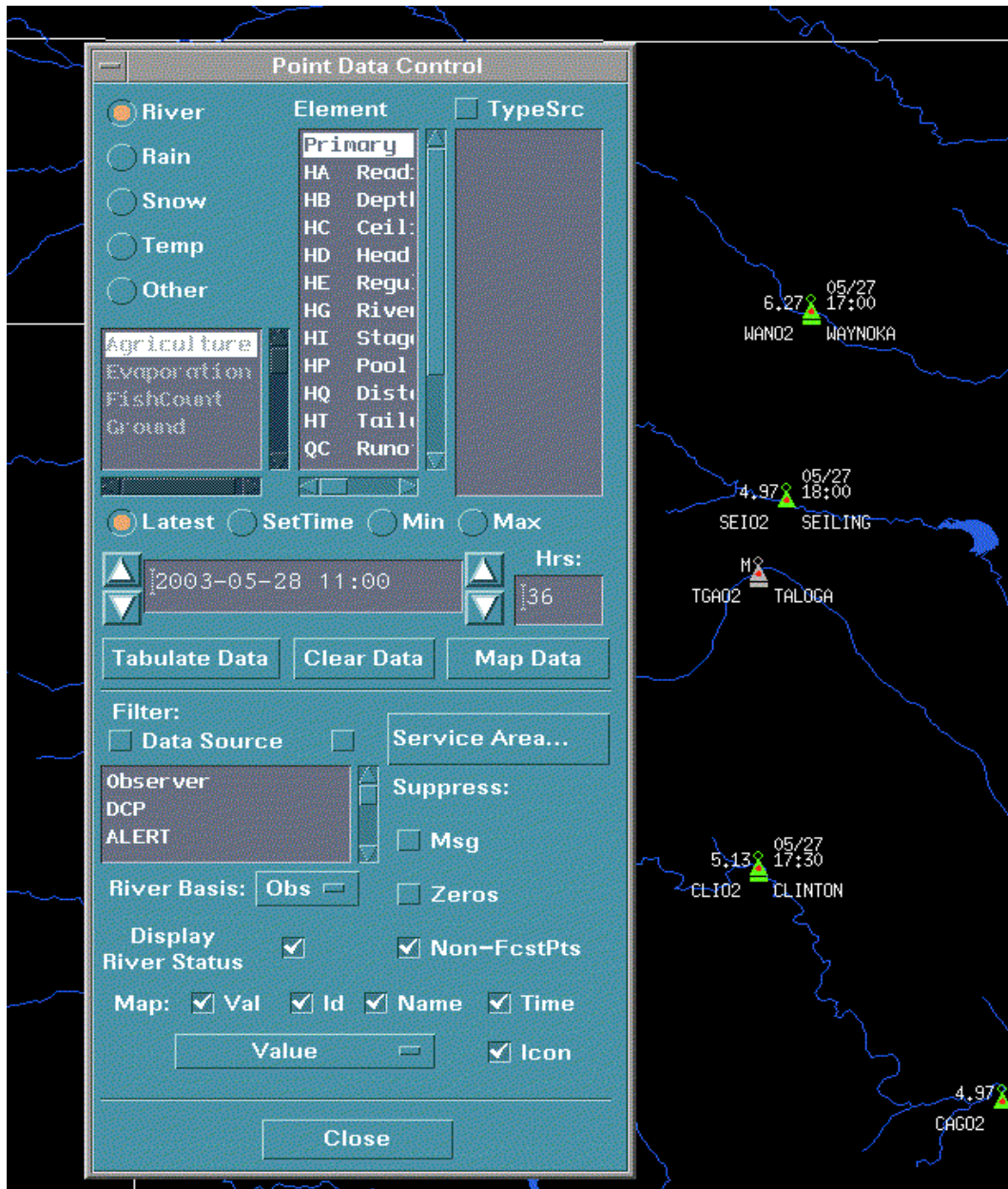


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1.0 INTRODUCTION

Hydroview/MPE provides the capability to view data at both the point and areal resolutions. This document describes the WHFS point display control feature, a Hydroview/MPE function which provides display of point data for specific locations. The point data displayed generally consists of one value per station; in that sense, the feature comprises a many station, single value mode of operation. This is in contrast to its complement function, the Time Series Viewer, which provides data in a single station, multi-value mode.

The point display control feature recognizes and exploits the SHEF-based structure of the data in the database. The control over the data selections is based on selecting the data as per its SHEF attributes. These include the physical element (PE), duration (instantaneous or XX hours), type-source (TS), and the extremum (minimum or maximum). The control over the point data selections is also governed by the data time. Point data will only be retrieved if it falls within a window of time specified by the user.

In addition to selecting point data based on its SHEF attributes and data times, it may also be selectively filtered according to its data source, its primary WFO (in regard to service backup), whether or not it is a forecast point, whether or not it is missing, and whether or not it has a value of zero.

The point data may be displayed both in a graphical manner as a station plot on the Hydroview/MPE map and in a tabular fashion as a listing of station point data in a text window. A simple coloring scheme of the point data station icons displayed on the Hydroview/MPE map facilitates the determination of the warning and flood stage status of individual river forecast/observation points.

The point display control feature allows the user to configure the display of the point data retrieved from the IHFS database. It includes the ability to toggle on/off the station's icon, identifier, name, value, and time stamp. It also includes the ability to display river station specific data such flood level, flood departure, and derived stage/flow and to base the station icon coloring on forecast, observed, or the maximum observed/forecast river stage/flow values.

This document presents a detailed discussion of the point data display interface used to control the displayed point data. Then, the point control tabular display is explored and a list of configurable parameters (i.e. tokens) which control the point data control settings is presented. Following this, the enhancements made to the point data control are outlined according to the AWIPS Build they were introduced in.

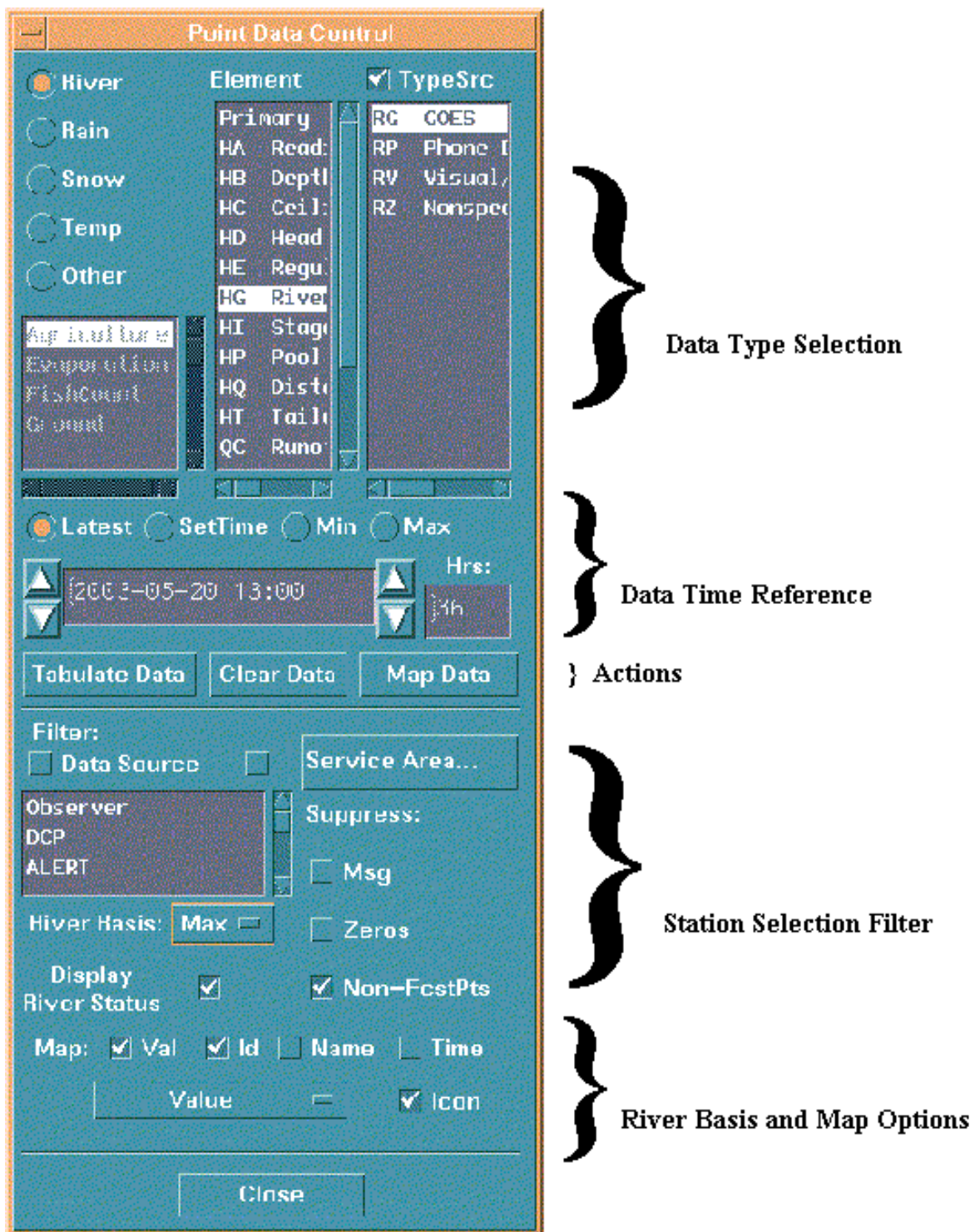


Figure 1. The Point Data Display Control GUI

2.0 POINT DISPLAY CONTROL INTERFACE

The point data control Graphical User Interface (GUI) is provided to manage the selection and subsequent display of the point data. The GUI window, as shown in Figure 1, can be envisioned as having five primary “parts”. These are, from the top to bottom on the GUI, the data type selection section, the data time reference selection section, the actions section, the station selection filter section, and the river basis/map options section. Each of these sections is described in detail below. All database tables mentioned in this document reside within the IHFS database.

2.1 Data Type Selection Section

The data type selection section is used to specify which class of physical elements (PE) to use, the PE to retrieve data for, and the Type Source (TS) of that PE.

2.1.1 Specify Primary Element

This radio box selection dictates which class of physical elements (PE) to display. The four explicit choices are River, Rain, Snow, and Temperature. The River item includes the height and discharge data. Note that when retrieving rain data, the data are retrieved from the CurPrecip table, not the Precip table. This is done, because typically the CurPrecip table retains a fewer number of days of data than the Precip table. Because the CurPrecip table has less data in it, rainfall data can be retrieved more quickly from it.

An additional entry of “Other” is provided for the remaining elements. When this is selected, the single-select scroll list associated with the “Other” selection lists the 15 remaining elements that can be selected (Agricultural, Evaporation, Fish Count, Ground, Ice, Lake, Moisture, GateDam, Pressure, Radiation, Weather, Wind, Power, Water Quality, Yunique). When the shef_procobs token is OFF, an additional item is also available in this list: “Processed”. In this case, the list will have 16 items. See the Token Controls section of this document for more details about the shef_procobs token.

Whenever the primary element is selected, the PE and TS scrolled lists are updated. These lists are discussed below.

2.1.2 Select Specific Physical Element (PE)

For the selected primary element, this list gives the SHEF-based PE entries available in the database table(s) associated with the selected element, as defined by the IngestFilter database table. For River, an additional item is listed (“Primary”) that instructs the program to use the primary PE defined for the river characteristics in the station. The primary PE for a river location is defined in the RiverStat table. It is typically set to HG (stage) or QR (discharge). For Precip, an additional item is listed (“PC and PP”). This instructs the program to use the “best” value among the candidate PC and PP values. The best value is determined by the value which

covers the greater portion of the requested duration (e.g. 24 hours).

2.1.3 Select Specific Type-source (TS)

For the selected PE, this list gives the unique SHEF-based TS entries as defined via the IngestFilter. This is updated when the user selects a different PE. There is a toggle button that indicates whether the program should consider the TS when processing the request. If the toggle is set on, then only one TS can be selected. If the toggle is set off (i.e. “don’t limit to a given TS”), then in the event that two values are available for a given lid-PE combination, the one with the highest TS-rank will be displayed. The TS-ranking is defined in the IngestFilter table. The TS-ranking rule does not apply for Precip data; for Precip data, the PE-TS combination which has the most data, in terms of number of hours covered, is used. The TS list is not displayed when requesting River data for the “Primary” PE.

Note that the primary key for the observed PE database tables is: location identifier (lid), PE, duration (dur), TS, extremum, and obstime. This key relates to the point control operations as follows. All lids are used, and one specifies the PE(s) to use. The duration is ignored, except for precip data which uses it of course. The TS is either explicitly specified or the TS-ranking is used. The obstime is considered, as discussed below. Lastly, only the daily min and max extremum codes are considered.

Because the IngestFilter database table is used to populate the PE and TS lists, the lists will include ALL possible entries, not just those entries that are within the database. This allows much quicker response when loading these lists, since the actual PE table need not be queried. It also allows the option to display data as MISSING, in the event that a location should have data in the database table but doesn’t. Missing values can be filtered as described later.

2.2 Data Time Reference Selection Section

The time window for which data are retrieved depends on the value of the three time reference fields, all of which work together to determine the time window and the manner in which the time window is used. These three fields are described below.

2.2.1 Time Mode

The time mode is specified as either: the latest time, a set time, the minimum, or the maximum.

When “latest” is selected for non-Rain requests, the program only considers data that are within the last N hours, where N is the hours value defined in the “Hrs:” textbox. This textbox is described in detail below. For Rain requests, the top of the latest hour is used, and the N value gives the duration.

When “set time” is selected for non-precip requests, the program looks for data in the time

window defined by the specified (center) time +/- N hours. For Rain requests, the end time is used, and the N value gives the duration.

When “min” or “max” is selected, the program looks for data with the min or max (as selected) SHEF-based extremum code for the selected duration. The following durations are supported (the min and max codes, respectively are shown in parentheses): 1 hour (F, D), 3 hour (G, E), 6 hour (H, R), 12 hour (P, Y), 18 hour (I, S), 24 hour (N, X), one-week (M, W). If a duration is given that does not match one of these durations, then the next lowest SHEF duration is used. For example, if 11 hours is given, then a duration of 6 hours is assumed. The time window for which it looks for the min or max with the selected duration ends at the specified ending time, and begins at the ending time minus the duration * 1.5. For example, if the ending time is 18Z, and the duration is 6 hours, and the requested data is the minimum, then the application looks for data from 9Z (=18-6*1.5) to 18Z, with a extremum code of “H”.

Note that there is no support for time modes of latest, min, or max when doing precipitation retrievals. The “set time” value is always used.

2.2.2 Ending/Center time

This multi-purpose field is used for all but the latest time reference option in a manner described above. The time defaults to the top of the most recent hour. Arrow buttons allow adjustment of the time by hour or day increments, or the user can manually enter a time.

2.2.3 Hour

This multi-purpose field takes on different meanings depending upon the time reference option. See above for details.

2.3 Actions Section

The user can either display the data on a map, or the data can be displayed in tabular fashion. The retrieval of data is determined by the user controlled options specified in the Data Type Selection and Data Time Reference Selection portions of the window. The remaining options on the window affect how the data are filtered and presented to the user.

In addition to being able to display the data on a map or in a tabular fashion, the user may also clear the displayed data from the Hydroview/MPE map. In this case, all of the data will be removed from the map that it is being displayed on. In order to redisplay the data on the map, the user will need to select the “Map Data” option.

When selecting the Tabulate Data or Map Data buttons, the application does NOT normally retrieve the data if no data options have changed (i.e. those options located above the tabulate and map buttons). If the refresh time has passed (e.g. 15 minutes) then a new retrieval is always performed when selecting the tabulate or map buttons, regardless of whether any options have

been changed. The refresh time may be changed from the default value of 15 minutes by explicitly setting the `hv_refresh_minutes` token to the desired number of elapsed minutes between automatic refreshes. Avoiding unnecessary retrievals of data is very helpful in improving the performance of the application. If non-data options are changed, such as the filter options and data display options located below the tabulate and map buttons, there is no need to re-retrieve the data.

2.4 Station Selection Filter Section

The first two sections of the GUI allow the user to control what data are to be considered for display. The station selection filter section allows the user to control which stations are to be considered from the set of data produced as per the instructions in sections one and two.

2.4.1 Data Source Filter

This station filter is specified by either the station's data "source(s)" or its service area assignments. Both the data source and the service area filter can be turned on and off via a toggle button. When turned on, the station is checked to see whether it has a defined source which is the same as one or more of the selected data sources, or whether it meets the service area criteria, respectively.

The possible data sources are either: Observer, DCP, or a telemetry type. A station is considered to have an Observer or DCP as a source if it has an entry defined in the Observer or DCP database tables, respectively. A telemetry source is assumed if the location has an entry defined in the Telem table. The information about a station's data sources which is used by this filter is contained in the `StnClass` database table. Note that the data source used for the filter refers to the station's data source(s), not the data source itself as specified in the `type-source (TS)` value.

2.4.2 Service Area Filter

Figure 2. shows the point control service area backup filter. This is launched from the main point control GUI by selecting the Service Area push button. The point data control GUI allows filtering by service area to be applied or not, and if it is applied, performs filtering by checking the location's responsible WFO as defined in the Location table. The user can specify one or more WFOs.

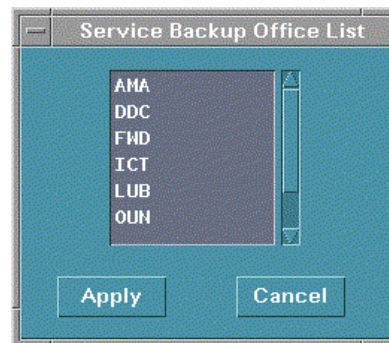


Figure 2. Service Backup Filter

2.4.3 Suppress Options

The point data filter also allows suppression of missing values and/or zero values and/or non-forecast points. The suppression of zeroes is typically only useful for Rain data requests.

A forecast point is one for which river forecasts are issued. The forecast points are defined in the RpfFcstPoint database table. Forecast points are also indicated by a character 'F' in the disp_class attribute of a station's entry in the StnClass database table.

When adding "missing" entries, the application uses the information in the IngestFilter database table to determine which station should be there, and for those stations which do not have a value, a "missing" entry is appended to the list of data.

One interesting implication of this is that if suppressing non-forecast point locations and not suppressing missing data, then one might expect to see all forecast points. However, if for a requested data type, a forecast point has no data, as indicated by the IngestFilter database table entries, then a missing report will NOT be listed for the forecast point location.

Because adding missing data requires a query of the IngestFilter database table, including missing data takes slightly more time than suppressing missing data.

If data are found for an area id for which no location information is defined (i.e. it is not a location but an area), then the value is filtered out automatically. Also, when filtering data, stations that have the "no-post" switch are ignored.

2.5 River Basis and Map Options Section

2.5.1 River Basis

This option applies to both tabular and geographical displays. For displays of river data, the user can specify whether to use the latest observed, the maximum forecast, or the maximum of the two. Note that the river basis only applies for the time mode option of Latest.

2.5.2 Map Options

These options only apply to the map display. At most, for each location, the map display shows 1) the icon, 2) the value, 3) the time, 4) the location id, 5) the location name, 6) and possibly a second value for the flood stage, flood departure, or derived stage/flow. The user can toggle the display of the first 5 items. When turning off the display of the value, the display of any second value is also turned off. The display of the second value is controlled by a pull down option menu adjacent to the map display toggle buttons. This menu contains the following options:

- Value - Display the value of the selected PE next to the station's icon. If it is missing and the display of missing values has not been suppressed, then it will be displayed as "M".
- Value/Fld Level - Show the flood level over the selected PE next to the station's icon. This option only applies to river data, and the flood level is read from the RiverStat database table. If it is not available, then it will be displayed "M".
- Value/Stage Flow - Show the derived stage/flow value over the value of the selected PE. Derived stage or flow can only be displayed for river stations which have rating curves

defined in the Rating database table. In addition, one of the following conditions must be met:

- ▶ The “Primary” PE has been selected, and the station’s primary PE is “HG” or “QR”. Flow is derived if the primary PE is HG. Stage is derived if the primary PE is QR.
- ▶ “HG” has been selected from the PE list. In this case flow will be derived.
- ▶ “QR” has been selected from the PE list. In this case stage will be derived.

If none of the above conditions have been met, then the derived stage/flow value will be shown as missing.

- Fld Depart - Display the flood departure next to the station icon. This only applies to river stations. The flood departure is obtained by subtracting the flood level from the observed or forecast river level at the station. A negative value indicates that the station’s river level is below the flood level. A positive value indicates that the station’s river level is above the flood level. If the flood departure is not available for the river station, then it is displayed as missing.
- Fld Depart / Level - Display the flood level over the flood departure next to the station icon. This only applies when the user is viewing river data. The flood level will either be in units of height or discharge depending on the station’s primary PE in the RiverStat database table. If the flood level is not available, then it will be displayed as missing.

Note that these options are only meaningful for geographical displays such as the map area of Hydroview/MPE. These options do not apply to the tabular point data display. The tabular point data GUI has columns for the flood level, flood departure and derived stage/flow information. If any of these data elements is not available for a station, then it is left blank.

2.5.3 Display River Status

For each displayed data point, the point data control can show two separate layers of information. These are the river status layer and the ad hoc layer. The river status information is conveyed through the colors of the river station icons. It indicates where the forecast or observed river stage/flow is in relation to the action and flood stage/flow levels for the station. A green station icon indicates that the river stage or river flow at that station is below the action and flood levels. A yellow station icon indicates that the station is at or above the action level but below the flood level. A red station icon indicates that the station is at or above the flood level. A gray station icon indicates that the station is not a river forecast point or that stage or flow data could not be retrieved for it. The river status coloring of the station icons allows river stations to be easily monitored for warning and flood conditions. The coloring stays on even if the user is not viewing river data in the ad hoc layer.

The ad hoc layer contains information representing the user’s PE, TS, and time selections. It is

represented through the use of text annotations surrounding each station's icons. The pull down option menu discussed above applies to the values displayed in the ad hoc point control data layer.

Displaying the river status information does place an additional burden on the computer. In situations where the user does not wish to view the riverstatus information, the coloring of the icons may be disabled by deactivating the "Display River Status" toggle button. This will speed up the retrieval of the user-requested point data.

3.0 TABULAR POINT CONTROL NOTES

The tabular point control output text window, as shown in Figure 3, presents a formatted text display of the point data. The data listed in the table via the Tabulate Data button is identical to the data shown on the Hydroview/MPE map via the Map Data Button. It allows the user to print this information or save it to a disk file. The user may also highlight a station in the tabular display and launch the Time Series application to display a time series graph or table. Time series provides the means of viewing how a physical element has varied over a period of time at a single station.

Point Data Tabular Display									
Station	Value	[Stg Flow]	Time	PE	TS	Dur	Extr	[Fld, Depart]	
ALX02	5.35	[2136.]	05-27 18:00	HG	RG	0	Z	[23.0 -17.6]	
AND02	7.14	[216.]	05-27 15:30	HG	RG	0	Z	[19.0 -11.9]	
ARCT2	4.50		05-27 17:30	HG	RG	0	Z	[22.0 -17.5]	
AWIP2	n								
AWIP3	n								
BKBT2	4.88	[6337.]	05-27 16:00	HG	RG	0	Z	[9.0 -4.1]	
BLK02	6.22	[659.]	05-27 16:00	HG	RG	0	Z	[29.0 -22.8]	
BLU02	3.53	[975.]	05-27 17:30	HG	RG	0	Z	[23.0 -19.5]	
BHT02	n								
CAG02	4.97	[1588.]	05-27 17:30	HG	RG	0	Z	[25.0 -20.0]	
CAR02	n								
CCK02	n								
CHY02	8.34		05-27 17:30	HG	RG	0	Z	[13.5 -5.2]	
CLT02	5.13		05-27 17:30	HG	RG	0	Z	[18.0 -12.9]	
CLV02	3.75		05-27 18:00	HG	RG	0	Z	[15.0 -11.2]	
CNE02	2.09		05-27 18:00	HG	RP	0	Z	[19.0 -16.9]	
DEKT2	11.69		05-27 18:00	HG	RG	0	Z	[25.0 -13.3]	
DOW02	11.45		05-27 16:00	HG	RG	0	Z	[17.0 -5.6]	
DUR02	11.73		05-27 17:30	HG	RG	0	Z	[27.0 -15.3]	
ELN02	6.51	[1756.]	05-27 15:00	HG	RG	0	Z	[17.0 -10.5]	
ELT2	10.16		05-27 15:00	HG	RG	0	Z	[24.0 -13.8]	
FCKN1	n								
FRS02	7.25		05-27 17:30	HG	RG	0	Z	[43.0 -35.8]	
GSVT2	14.46		05-27 17:00	HG	RG	0	Z	[25.0 -10.5]	
GTR02	3.86		05-27 17:30	HG	RG	0	Z	[13.0 -9.1]	
GUC02	n								
HEA02	7.82	[9888.]	05-27 17:30	HG	RG	0	Z	[12.0 -4.2]	

When invoking the time-series from the tabular listing, there are times when an exact match for the PE-TS-DUR-EXTREMUM key is not possible. In this case, when the time series (graph or map) is invoked, the best it can do is to bring up the control window for the given station, without displaying the actual tabular or graphical window. The classic case where this occurs is for precipitation data, which has a duration assigned by the point control function which probably does not match any duration found for a key in the appropriate data records.

Figure 3. Point Data Tabular Display

The tabular display shows the flood level and departure from flood level, if the flood level is available and if data for physical elements of H* or Q* are being displayed. The flood level is given in units of stage or discharge, depending upon the Primary PE designation in the RiverStat table. Also, if the action level is set, then the value is compared to this level. If it exceeds the action level, then the entry in the tabular list for this station denotes that the level was exceeded (>ACTION!!).

The tabular display also shows derived stage/flow if river data with a PE of HG, QR, or PRIMARY are being displayed and a rating curve is available for the station in the Rating table. In the case of the PRIMARY river data type, the Primary PE for a station in the RiverStat table must be either HG or QR.

4.0 TOKEN CONTROLS

The following tokens are used by the point control function:

Initial Settings:

- hv_durhours - Specifies the initial duration in hours that applies to the time window used for the retrievals. The token value is simply a positive integer value. If no token value is defined, a value of 24 hours is assumed.
- hv_pets - Specifies the initial PE and the optional TS value for which data will be retrieved. The value is either the keyword “PRIMARY”, “PCPP”, or <PE>, or <PETS>, where PRIMARY implies the River data type using the Primary PE, PCPP implies the Precip data type using the best PC or PP based value, <PE> is simply a specific physical element value, and <PETS> is a specific PE-TS combination. When specifying the physical element in the <PE> or <PETS> form, only a River, Precip, Temperature, or Snow PE can be given; the “other” PE values are not recognized for this token. If no token value is defined, a value of PRIMARY is assumed.
- hv_riverbasis - Specifies the initial setting indicating which type of value is used to base the single, representative value for river values. The possible values are “obs”, “fcst”, and “maxobsfcst”, where “obs” implies use of the latest observed value, “fcst” implies use of the maximum forecast value, and “maxobsfcst” implies use of the maximum of the two. The single value so obtained is used to color the river icon on the main geographic display, and can also be listed using the tabular fashion. If no token value is defined, a value of maxobsfcst is assumed.
- hv_pointdata_display - Specifies the initial state of the “Display River Status” toggle button which determines whether or not river station icons are colored according to river status. This token may be set to “OFF” or “ON”. When this token is set to “OFF”, initialization of point data is not performed when Hydroview/MPE is started. This decreases the amount of time required to get the application up and running.

Data Processing Options:

- shef_procobs - This controls whether the list of “other” table includes Processed or not, and where to find data with a TS of P*. If set to ON, then Processed data are co-mingled with observed data, so the other list will not include Processed data, and the TS=P* data will be expected to be in the applicable PE table.
- shef_post_latest - If this is set to ON, then retrievals for Latest data use this data table, which results in retrievals which are much faster.

5.0 HISTORY OF ENHANCEMENTS

This section will present the AWIPS Release 5.1.1 point data control enhancements followed by

the AWIPS Release OB2 enhancements.

5.1 Build 5.1.1 Enhancements

In Build 5.1.1, the “point display” feature in WHFS was completely replaced with a new, more comprehensive, more flexible, and more efficient package. The changes made to pointcontrol included the following:

All PEs can now be plotted:

In addition to the previously available selections for displaying Height, Rain, Snow, and Temperature data, the user can now select any of the other 12 observational PE data tables. These other 15 tables are: Agricultural, Evaporation, Fish Count, Ground, Ice, Lake, Moisture, GateDam, Power, Pressure, Radiation, Water Quality, Weather, Wind, and Yunique. In addition, the Discharge data are grouped with the Height data to form a new class of data termed River data.

Greatly increased control over which PE-TS is used:

Formerly, one had little control over which PE and TS are considered/used when selecting either one for the River, Precip, Snow, or Temperature. For example, selecting Snow and Temperature only supported the PEs of SW and TA only, respectively; selecting Precipitation used the “best” PE-TS value based on hours covered, and selecting height data used the “best” PE-TS based on primary pe and ts-rank settings, but limited the display to only the best. Now, for any data type, the user can explicitly select which PE-TS to use, or can use the “best” feature for Precipitation data, or the “ts-rank” feature for other elements, to let the program decide which TS of the given PE to use.

Greatly increased control over which time reference is used:

Formerly, only the latest value was available for most data. Precipitation data was the exception in that it allowed control over the ending time. Now the user can select additional time references. Specifically, a set ending time can be specified for any element, and the user can also request the min or the max over some set number of hours.

Min/max data can be selected:

Previously, data explicitly labeled as minimums or maximums could not be plotted. Now the SHEF “extremum” attribute associated with each value is used. This attributes can denote a value as being a minimum or maximum, and the duration over which it is considered a minimum or maximum (i.e. 24 hours).

New Tabular Feature and Linkage to Timeseries:

Previously, the user could specify options regarding which data to display, and the data could be displayed in geographic form only. The build 5.1.1 point data control GUI allowed the same data to be tabulated, from where it can be saved and/or printed, or the user can invoke the time-series display to view the entire time-series for the given lid-pe-ts. Conceptually, the time-series and point display work in a complementary fashion, where time-series gives many times for a single lid-PE-TS-etc., while a point display will give many lid-PE-TS-etc. for a single time.

Improved Retrieval Performance:

The manner in which the data are retrieved was optimized to greatly increase retrieval times for certain requests. For retrievals of the latest data for all but River and Rain data, this method will get data from the LatestObsValue table if the shef_post_latest token is set; this retrieval method is very fast. If the token is not set, then these retrievals will extract data from the PE tables, as was done in the previous implementation, and which is not as fast. For retrievals of the latest River data, the query is rather quick because the retrieval is from the RiverStatus table. For Rain data, the retrieval is from the CurPrecip table, as was done in the previous implementation. For requests for data that is not the latest data, the retrievals are always from the PE tables.

Regardless of which table is read, the new implementation uses a faster strategy for getting the data. This method is centered around the strategy of getting all data with one query, then having the program extract the necessary info, as opposed to the former method of looping on each location, and attempting to extract data for each station separately.

Another manner in which the new implementation is faster is that now the data are only retrieved when necessary; in other words only when some criteria for retrieving data, such as the ending time, was changed. If the user simply wants to turn the icons off, or filter the stations, there is no need to retrieve the data, as was done in the previous implementation. The GUI controls which do NOT affect the retrieval process are grouped in the bottom of the point control window, below the Map Data and Tabulate Data pushbuttons

Support of Service Backup Filtering:

In 5.1.1, an additional criteria for filtering data was provided. The user could filter stations based on the service area assignments.

Consideration of Data Precision in Map Plots:

When displaying the numerical values on the geographical displays, the number is shown with the appropriate number of significant digits (i.e. to the right of the decimal point) for most data types. For the other data types, the default of two digits to the right (i.e. hundredths) is used. This recognition of the precision makes certain plots more readable, such as those for temperature, which only uses whole numbers.

Simplification of Icon Display Control:

There no longer is an option to control icon-only displays independent of the data display control. This feature unnecessarily cluttered the GUI control. The new GUI allows the user to toggle icons and data at their discretion, so icons-only displays can still be generated if desired. The new paradigm is that data are requested and the stations which have, or which are expected to have, that data are displayed. The old paradigm in which stations types are selected, and then data for the stations are retrieved, has been replaced.

As part of this change, one feature no longer available is the means to display icons for “undefined” stations. Also, the user no longer can display “reservoir” stations explicitly. One can display data typically found for reservoirs (e.g. HP, HT data).

Icon shapes for stations are still based on the entire suite of data expected for the station, whether it include river data, reservoir data, general meteorological data, and whether the station is an official forecast point.

Suppression of Missing Data for Any Element:

Previously, the suppress missing option was available only for precip data. In 5.11 it was set up to be done for any display.

5.2 Build OB2 Enhancements

The point display feature underwent another round of modifications for Build OB2. Many of these were improvements to the efficiency with which point data is retrieved from the IHFS database and plotted on the map display area. But some of the changes also provided the user with more flexibility and added functionality for viewing point data. These included the option to toggle on and off river status coloring of icons, a simplified service area filter, and the option to display derived stage and flow.

River Forecast Station Icon Colors may be Suppressed:

An important feature of the point data display control is the color coding of river forecast stations to represent river status. The green, yellow, and red colors respectively indicate whether a station is below action stage, at or above action stage but below flood stage, or at or above flood stage.

However, when the point data display control is being used to view non-river point data or when river status is not a concern, the display of the icon colors can be suppressed. Doing this will improve the time it takes point control to process point data.

The display of river status colors is controlled by the “Display River Status” toggle button on the Point Data Control GUI. The initial state of this toggle button is controlled by the “hv_pointdata_display” token.

Service Backup is Limited to Filtering by Responsible WFO:

The service backup feature has been simplified in Build OB2. It now only allows service backup filtering based on a station's responsible WFO. The primary and secondary backup WFOs are no longer used. This makes the use of the service backup feature more intuitive and eliminates logic considerations the user had to take into account when using the pre OB2 version of the service backup filter. The new service backup window is shown in figure 3.

Derived Stage and Flow may now be Displayed for River Forecast Stations:

In addition to the options for displaying a river forecast station's value along with its flood level, the pointcontrol GUI now provides the option to display the station's value along with a derived stage or flow value.

This option is applicable to river forecast stations which have rating curves defined for them. It is only displayable for the river primary element group. When the "Primary" PE is selected from this group and a river station has a primary PE of HG (river stage) or QR (river flow), then a derived flow or stage value will be computed using the station's rating curve and displayed next to the station's icon and value. If "HG" or "QR" is explicitly selected from the PE list for the river primary element group, then for all river stations reporting HG or QR, stage or flow data will be derived using the station's rating curve and displayed next to the station's icon. Whether a stage or flow value is derived depends on the PE of the datum reported by the river station. If the station is reporting a HG value, then a flow value is derived for it. If the station is reporting a QR value, then a stage value is derived for it.

Point Control Software Streamlined for Efficiency:

The point control software has been modified to make use of efficient binary searching algorithms, allowing point data to be processed more quickly.